Small Business Innovation Research/Small Business Tech Transfer

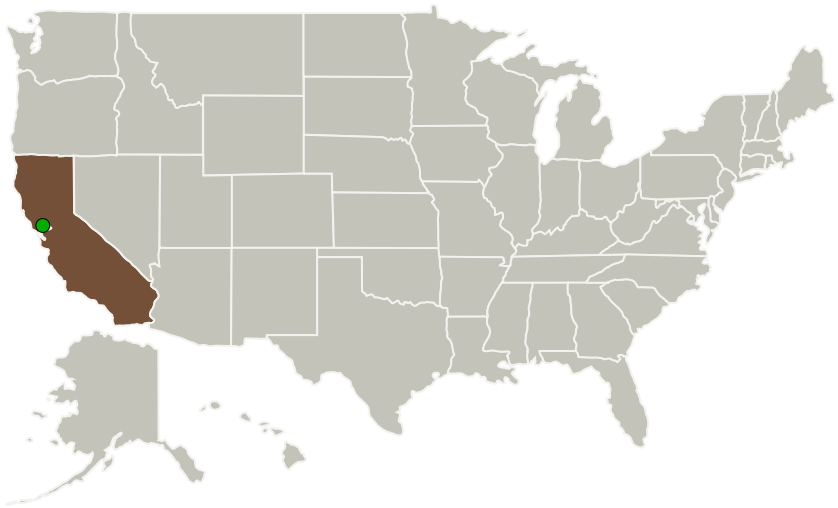
Airport Movement Area Closure Planner, Phase I

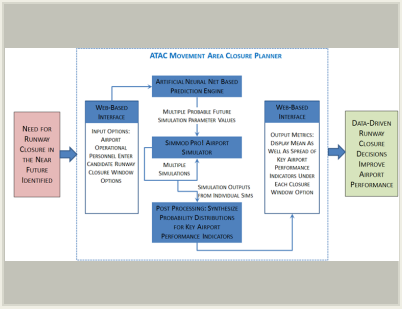
Completed Technology Project (2017 - 2017)

Project Introduction

This SBIR research develops an automation tool improving temporary and permanent runway closure management. The Movement Area Closure Planner (MACP) provides airport stakeholder capability to improve decision processes and decision outcomes during surface closure events by developing a what-if simulation functionality to explore multiple operational decision choices during surface closure events. MACP ensures realistic simulation of airport traffic operations by relying on a high-fidelity airport simulator which has been used in multiple high-fidelity airport operations analyses for FAA and airport operational improvement evaluation projects. The key innovation added to a high-fidelity simulator is a machine learning based predictive engine which realistically projects multiple probable future evolution trajectories for key factors influencing the airport operations under surface closure events (e.g., predicted gate pushback rates, predicted runway arrival and departure demands, predicted departure queue lengths, predicted de-ice pad queue lengths). Reliable what-if analysis is enabled by taking each of these probable evolution trajectories of key variables and kicking off multiple airport traffic simulations, each simulating airport traffic under one of these probable scenarios. Another variable input for the simulations is surface closure operational decision parameters, e.g., start and end times for runway closure. Multiple probable futures are simulated for each choice of surface closure operational decision parameter, thereby enabling us to predict not just one value for key airport performance metrics, but multiple probable values each associated with its probability of occurrence.

Primary U.S. Work Locations and Key Partners





Airport Movement Area Closure Planner, Phase I Briefing Chart Image

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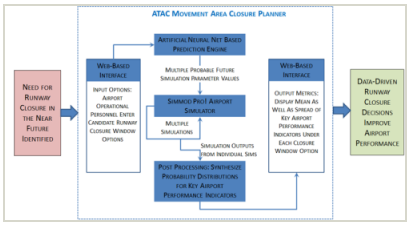
Organizations Performing Work	Role	Type	Location
ATAC	Lead Organization	Industry	Santa Clara, California
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations
California

Images



Briefing Chart Image
Airport Movement Area Closure Planner, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/129568)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
ATAC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

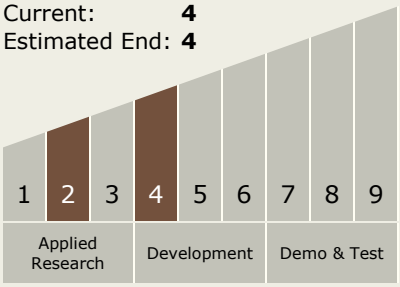
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
William Keller

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System